

WHAT IS CLAIMED IS:

1. A non-linear optical material comprising a bismuth film capable of producing non-linear optical effects including non-linear refraction and non-linear absorption.
2. The non-linear optical material of claim 1, wherein the bismuth film is formed by pulsed laser deposition.
3. The non-linear optical material of claim 1, wherein a thickness of the bismuth film is approximately 10.5nm.
4. The non-linear optical material of claim 1, wherein the bismuth film is covered by a top protective layer.
5. The non-linear optical material of claim 4, wherein the top protective layer is transparent.
6. The non-linear optical material of claim 4, wherein the top protective layer comprises  $\text{Al}_2\text{O}_3$ .
7. The non-linear optical material of claim 1, wherein the bismuth film is disposed on a base layer.
8. The non-linear optical material of claim 7, wherein the base layer comprises glass.
9. The non-linear optical material of claim 7, wherein the base layer comprises quartz.
10. The non-linear optical material of claim 1, which is used as a non-linear optical device in an optical method or in an optical apparatus.